

DISCUSSION OF THE CLAIMS

Claims 1-2, 5-7, 10-24, 27-28 and 30-33 are active in the present application. Claims 3-4, 8-9, 25-26 and 29 are canceled claims. Independent Claim 1 is amended. Support for the amendment is found in the paragraph bridging pages 27 and 28; the paragraph bridging pages 2 and 3; and the second full paragraph on page 17. Support for new Claims 31-33 is found in the previously presented claims and as described for the amendment to Claim 1.

No new matter is added.

REMARKS

Independent Claim 1 is now drawn to a method of reclaiming a used silicon wafer from a semiconductor manufacturing process. The method of present Claim 1 includes a film removal process whereby at least one of a metal film, a metal silicide film, a metal oxide film and a metal nitride film is removed from the surface of a silicon wafer. The method of Claim 1 further includes contacting the silicon surface that is formed by the film removal process with at least one of an SC1 and an SC2 liquid to thereby diffuse copper from the interior of the silicon wafer to a surface of the silicon wafer. Subsequently, a heating/removal process is carried out whereby a portion of the silicon surface containing copper is removed from the silicon wafer and a reclaimed silicon wafer having a copper concentration of less than 2×10^{12} atom/cm³ is formed. Applicants submit that the method of present Claim 1 is not obvious over the art relied on by the Office in the April 24, 2009 Office Action.

Previously presented Claim 29 recited a step of contacting a top surface of a silicon wafer with at least one of an SC1 and SC2 liquid after the film removal process and before the heating/removal process. The Office rejected previously pending Claim 29 as obvious over a combination of Lawrence '567 (U.S. 3,293,567); Lawrence '875 (U.S. 5,622,875); Falster (U.S. 6,100,167); and Linn (U.S. 5,932,022).

The Office characterizes Linn as follows:

Linn et al. teaches an immersion process for chemically processing a bare silicon wafer should be performed prior to a heating step 115 (Figure 1), wherein the processing liquid can be a mixed solution of hydrogen peroxide, ammonia, and water (SC1 cleaning solution; Step 101; Column 3, Lines 13-20), or a mixed solution of hydrogen peroxide, hydrochloric acid, and water (SC1 cleaning solution; Step 109; Column 3, Lines 55-65).

See the last full paragraph on page 7 of the April 24 Office Action.

Applicants submit that present Claim 1 is patentable over the combination of the Lawrence '567 & '875, Falster and Linn. For example, the cited art fails to disclose or suggest a process in which an SC1 and/or SC2 liquid is used for the purpose of diffusing copper ions from a used silicon wafer to a surface of the silicon wafer. The SC1/SC2 liquid of the presently claimed invention is contacted with the silicon wafer after the used silicon wafer has been subjected to a film removal process to remove, for example, a metal oxide film from the silicon wafer. In contrast, Linn discloses a process in which an SC1 liquid is contacted with a silicon wafer to remove particles from the surface of the silicone wafer (see the Abstract of Linn).

Further, importantly, the process of Linn forms a silicon wafer having an oxide layer. This stands in stark contrast to the presently claimed invention which forms a reclaimed silicon wafer having a silicon surface, not an oxide surface.

The process of the present claims forms a reclaimed silicon wafer that has a silicon surface and a concentration of copper that is less than 2×10^{12} atom/cm³ in a manner that includes removing at least one of a metal film, a metal silicide film, a metal oxide film and/or a metal nitride film from a used silicon wafer to form a silicon wafer having a silicon surface. The process of Linn accomplishes the opposite; namely, **Linn grows a metal oxide film on a silicon wafer surface**. Applicants submit that the purpose, function, and effect of the present claims are substantially different than the process disclosed in Linn and thus those of ordinary skill in the art would not turn to Linn as a teaching and/or inspiration for a process that forms a product of substantially different structure and composition than the oxide layer coated surface formed by the process of Linn.

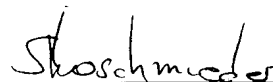
Applicants draw the Office's attention to new dependent Claim 31 in which an SC2 liquid is contacted with the silicon surface. Applicants submit that new dependent Claim 31

is further patentable over the art of record for the reason that Linn utilizes an SC-2 liquid to form and/or treat an oxide layer, not a silicon layer.

For the reasons discussed above, Applicants submit that the present claims are patentable over the art of record and respectfully request withdrawal of the rejection.

Respectfully submitted,

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